PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Peter M. Bonutti and James S. Hawkins
Serial No.	:	
A continuation of Application Serial No. 08/470,142		
Filing Date	:	herewith
For	:	METHOD OF USING EXPANDABLE CANNULA
Group Art Unit	:	3309(?)
Examiner	:	M. Thaler (?)
Attorney Docket No.	:	BON-2950-2

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Before action, please amend the above-identified application as follows:

In the Specification:

Please change the title of this application from "METHOD OF USING EXPANDABLE CANNULA" to:

EXPANDABLE CANNULA

Please delete the paragraph which extends from line 3 through line 12 of page 1 of the specification and insert the following paragraph thereat:

This application is a continuation of U.S. Patent Application Serial No. 08/470,142, filed June 6, 1995. The aforementioned application Serial No. 08/470,142 is a continuation-in-part of U.S. Patent Application Serial No. 08/254,368, filed June 6, 1994 (now U.S. Patent No. 5,573,517). The aforementioned application Serial No. 08/254,368, filed June 6, 1994 is a divisional of U.S. Patent Application Serial No. 08/013,942, filed February 4, 1993 (now U.S. Patent No. 5,320,611). The benefit of the earlier filing dates of the aforementioned U.S. patent application Serial Nos. 08/470,142; 08/254,368; and 08/013,942 is hereby claimed for all subject matter common to this application and the aforementioned applications.

A marked up copy showing changes made and a clean copy of the changes are enclosed herewith.

In the Claims:

Please cancel claims 2-56 without prejudice.

Please add the following claims:

57. An expandable cannula which is movable into a patient's body tissue, said cannula comprising a tubular sheath leaving a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which the passage through said sheath has a relatively small cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which the passage through said sheath has a relatively large cross sectional size in a plane

perpendicular to the longitudinal central axis of said sheath, said sheath having an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the contracted condition.

58. An expandable cannula as set forth in claim 57 wherein said passage in said sheath has an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the contracted condition.

59. An expandable cannula as set forth in claim 57 wherein said sheath has an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the expanded condition.

60. An expandable cannula as set forth in claim 59 wherein said passage in said sheath has an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the expanded condition.

61. An expandable cannula as set forth in claim 57 wherein said passage in said sheath is engageable by a member having an oval cross sectional configuration in a plane extending perpendicular to the longitudinal central axis of said sheath, said member having an oval cross sectional configuration being axially movable along said passage in said sheath to expand said sheath from the contracted condition to the expanded condition.

62. An expandable cannula as set forth in claim 57 further including pump means connected in fluid communication with said passage in said sheath, said pump means being operable to provide fluid pressure which is applied to

said passage in said sheath to expand said sheath from the contracted condition to the expanded condition.

63. An expandable cannula as set forth in claim 57 further including an array of wires which is enclosed by said sheath, said array of wires being expandable with said sheath during expansion of said sheath from the contracted condition to the expanded condition.

64. An expandable cannula as set forth in claim 57 further including a variable volume chamber connected with said sheath and movable into the patient's body tissue with at least a portion of said sheath, said variable volume chamber being expandable under the influence of fluid pressure to an extended condition in which said variable volume chamber projects outward form a side surface of said sheath to retard withdrawal of said sheath from the patient's body tissue.

65. An expandable cannula as set forth in claim 57 wherein said cannula has a pointed end portion for piercing the patient's body tissue when said sheath is in the contracted condition and has an oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath.

66. An expandable cannula which is movable into a patient's body tissue, said cannula comprising a tubular sheath which at least partially encloses an array of filaments which extends between axially opposite end portions of said sheath, said sheath and said array of filaments being resiliently expandable from a contracted condition in which said sheath and said array of filaments have a relatively small cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and

said array of filaments leave a relatively large cross sectional size in a plane perpendicular to the longitudinal central axis of said sheath.

67. An expandable cannula as set forth in claim 66 wherein said sheath and said array of filament have a relatively small oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the contracted condition and a relatively large oval cross section in a plane extending perpendicular to the longitudinal central axis of said sheath when said sheath is in the expanded condition.

68. An expandable cannula as set forth in claim 66 wherein said sheath has a passage which extends between opposite end portions of said sheath, said sheath and said array of filaments being resiliently expandable from a contracted condition in which the passage through the sheath has a relatively small oval cross sectional size in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which the passage through said sheath has a relatively large oval cross sectional size in a plane perpendicular to the longitudinal central axis of said sheath.

69. An expandable cannula as set forth in claim 66 wherein said sheath has a passage which extends between opposite end portions of said sheath, said array of filaments extend along an inner side of said passage, said sheath, passage, and array of filaments being resiliently expandable from a contracted condition in which said sheath, passage, and array of filaments have relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath, passage, and

array of filaments have relatively large oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath.

70. An expandable cannula as set forth in claim 66 wherein said sheath has a passage which extends between opposite end portions of said sheath, said passage in said sheath is engagable by a member having an oval cross sectional configuration in a plane extending perpendicular to a longitudinal central axis of said sheath, said member having an oval cross sectional configuration being axially movable along said passage to expand said sheath and array of filaments from the contracted condition to the expanded condition.

71. An expandable cannula as set forth in claim 66 wherein said sheath has a passage which extends between opposite end portions of said sheath, pump means connected in fluid communication with said passage in said sheath, said pump means being operable to provide fluid pressure which is applied to said passage in said sheath to expand said sheath and array of filaments from the contracted condition to the expanded condition.

72. An expandable cannula as set forth in claim 66 further including a variable volume chamber connected with said sheath and insertable into the patient's body tissue with at least a portion of said sheath, said variable volume chamber being expandable under the influence of fluid pressure to an extended condition in which said variable volume chamber projects outward from a side surface of said sheath to retard withdrawal of said sheath from the patient's body tissue.

73. An expandable cannula as set forth in claim 66 wherein said sheath has a pointed end portion for piercing body tissue when said sheath and array of filaments are in the contracted condition.

74. An expandable cannula which is movable into a patient's body tissue, said cannula comprising a tubular sheath having a passage which extends between axially opposite end portions of said sheath, said sheath being resiliently expandable from a contracted condition in which said sheath and passage have relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath to an expanded condition in which said sheath and passage have relatively large oval cross sectional sizes in a plane perpendicular to the longitudinal central axis of said sheath, and a pointed end portion for piercing body tissue when said sheath and passage have the relatively small oval cross sectional sizes in a plane perpendicular to a longitudinal central axis of said sheath.

75. An expandable cannula as set forth in claim 74 wherein said pointed end portion is at least partially formed by said sheath.

76. An expandable cannula as set forth in claim 74 further including an array of filaments which extends between axially opposite end portions of said sheath, said array of filaments being expandable with said sheath and passage from a contracted condition in which said array of filaments has a relatively small size in a plane perpendicular to the longitudinal central axis of said sheath to an expanded condition in which said array of filaments has a relatively large size in a plane perpendicular to a longitudinal central axis of said sheath.

77. An expandable cannula as set forth in claim 73 wherein said passage in said sheath is engagable by a member having an oval cross sectional configuration in a plane extending perpendicular to the longitudinal central axis of said sheath, said member having an oral cross sectional configuration being axially movable along said passage in said sheath to expand said sheath from the contracted condition to the expanded condition.

78. An expandable cannula as set forth in claim 74 further including pump means connected in fluid communication with said passage in said sheath, said pump means being operable to provide fluid pressure which is applied to said passage in said sheath to expand said sheath from the contracted condition to the expanded condition.

79. An expandable cannula as set forth in claim 74 further including a variable volume chamber connected with said sheath and movable into the patient's body tissue with a least a portion of said sheath, said variable volume chamber being expandable under the influence of fluid pressure to an extended condition in which said variable volume chamber projects outward from a side surface of said sheath to retard withdrawal of said sheath from the patient's body tissue.

REMARKS

This Amendment is being submitted before action in order to expedite the prosecution of this application.

If for any reason the Examiner believes that a telephone conference would expedite the prosecution of this application, it is respectfully requested that the Examiner call applicants' attorneys in Cleveland, Ohio at 621-2234, area code 216. Please charge any deficiency in the fees for this application to our Deposit Account No. 20-0090.

Respectfully submitted,

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VERSION WITH MARKINGS SHOWING CHANGES MADE

In the Specification:

The first paragraph is to be deleted and replaced therewith:

~~This application is a continuation-in-part of U.S. patent Application Serial No. 08/254,368, filed June 6, 1994. The aforementioned Application Serial No. 08/254,368 is a divisional of U.S. Patent Application Serial No. 08/013,942, filed February 4, 1993 (now U.S. Patent No. 5,320,611). The benefit of the earlier filing dates of the aforementioned Application Serial No. 08/254,368 and Application Serial No. 08/013,942 is hereby claimed for all subject matter common to this application and the aforementioned applications.~~

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CLEAN VERSION

This application is a continuation of U.S. Patent Application Serial No. 08/470,142, filed June 6, 1995. The aforementioned application Serial No. 08/470,142 is a continuation-in-part of U.S. Patent Application Serial No. 08/254,368, filed June 6, 1994 (now U.S. Patent No. 5,573,517). The aforementioned application Serial No. 08/254,368, filed June 6, 1994 is a divisional of U.S. Patent Application Serial No. 08/013,942, filed February 4, 1993 (now U.S. Patent No. 5,320,611). The benefit of the earlier filing dates of the aforementioned U.S. patent application Serial Nos. 08/470,142; 08/254,368; and 08/013,942 is hereby claimed for all subject matter common to this application and the aforementioned applications.